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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/826,643	04/16/2004	Jinhua Huang	143770	2293

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EXAMINER
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LEJA, RONALD W

ART UNIT	PAPER NUMBER
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2836

DATE MAILED: 12/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/826,643

Applicant(s)

HUANG, JINHUA

Examiner

Ronald W. Leja

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 July 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/16/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-11, 21 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The language of Claim 1 is confusing in that if a respective diode is connected between the terminals of a coil group and the coil groups are separated by a separation line, then the connecting of the quench heater between the separation line and the diodes would result in the quench heater being by-passed by the diodes. Looking at Applicant's Figures, it is suggested that the language of Claim 1 reflect that at least one first diode be connected via a first terminal to a first terminal of a first coil group and at least one second diode be connected via a first terminal to a first terminal of a second coil group; the coil groups separated by connection of a separation line to a second terminal of each coil group. The connection of the quench heater between the separation line and second terminals of the diodes would then not result in by-pass of the quench heater. The dependent claims would then need to be checked for consistency in claim language and accuracy. It is not understood how Claim 3 further limits the instant language of Claim 1. Perhaps, Claim 3 should read as "... wherein said connecting at least one quench heater between the separation line and the first and second diode comprises connecting [at least] one quench heater between the separation line and the first and second diodes". Addressing Claim 11, if in the first paragraph, the alternative language of "connecting at least one diode in parallel with the quench heater" was chosen, then the second paragraph does not make sense, since the "shunt" resistor is shown in Applicant's Figures as being in

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parallel with a parallel connected diode/quench heater. Claim 21 is confusing in that Claim 20 requires that the first diode and first quench heater are in parallel with said first coil group and that the second diode and second quench heater are in parallel with said second coil group. Therefore, how can the second diode be in parallel with the first diode? Due to the dependency of Claim 22 from that of Claim 13, the shunt resistor is in series with the first diode and in parallel with the first quench heater, and as such, Claim 22 is not understood.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 8-15, 18-22 and 24-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Huang et al. (6,147,844).

Huang et al. disclose quench protection for a coil system, which can be utilized in a MR imaging application. See Col. 1, lines 10-31. For Claims 24-26, the system utilizes a plurality of coil groups i.e. (16, 17, 28) and (6, 7, 29) with coils (28) and (29) being bucking or shielding coils for reducing field blooming effects. Diodes are utilized for substantially zero eddy currents and the coil groups' arrangement results in no unbalanced quench forces during quenching events. See Col. 2, lines 10-61. Figure 2 (for Claim 1) illustrates a first coil group (16, 17) with a first diode (35), a second coil group (18, 19) with a second diode (45) and a separation line between the two groups. Quench heater (32) is considered to be connected between the separation line (via the node between group (16, 17) and group (18, 19)) and the first (35) and

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second (45) diodes (via the node between the two diodes). For Claim 2, Figure 1 illustrates shielding coil (28), resistor (31) is considered a parallel connected shunt resistor for Claim 8 and diode (36) is considered a protecting diode for Claim 9. Diodes (35, 36) and diodes (45, 46) are for Claim 10. For Claim 11, see Figure 3 for shunt resistor (31) (also for Claim 22), quench heater (32) and diode (138). For Claims 13-15 and 18-22, Figure 3 illustrates a first coil group (16, 17) and wherein (28) is a shielding coil (Fig. 1) (for Claim 18). Quench heater (32) is in series with first diode (138) and diode (139) is a second diode in anti-parallel with diode (138). Col. 4, lines 54-62 indicates that the illustration in Figure 3 extends for all coil groups, and therefore, meets Claims 15, and 19-21.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al..

Claim 23 additionally requires the use of a computer for the MR imaging system. Huang et al. merely refers to port (24) for access from control and power. It is the opinion of the Examiner that it would have been obvious to utilize a computer being connected thru port (24) for more precise and remote control of the MR imaging system thereby gaining more precise and accurate data from the imaged volume.

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Claims 4-7, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. as applied to Claims 1, 3 and 13 -15 above, and further in view of Gross et al. (5,650,903).

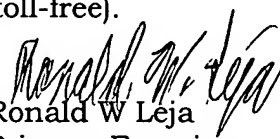
Claims 4, 5 and 16 require the use of an additional resistor, i.e. in series with the first and second diodes and/or in parallel with the first and second quench heaters. Although Huang et al. disclose the use of resistors for shunting and dumping in an effort to help control the system during a quench so as to not have fringe fields, eddy currents and etc..., Huang et al. do not appear to disclose the use of a dump/shunt resistor as applied to these particular dependent claims. However, Gross et al. teach the use of such a resistor (56) being in series with the diodes, connected to the separation line and in parallel to the heaters (Col. 5, lines 11-13). It is the opinion of the Examiner that it would have been obvious to include such a resistor as a means to limit the voltage seen by the coil groups during a quenching event, thereby helping to ensure that high voltages do not damage the insulation surrounding the coils during quenching. This would lead to a more durable system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ronald W. Leja whose telephone number is (571)272-2053. The examiner can normally be reached on Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (571)272-2800. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Ronald W Leja  
Primary Examiner  
Art Unit 2836

rwl  
November 24, 2005

*11/24/05*